Stoller
Hanford Office

DOE-EM/GJ1060-2005

299-E26-72 (A6665)
Log Data Report

Borehole Information:

Borehole: 299-E26-72 (A6665)			**Site:** 216-A-24 Crib		
Coordinates (WA St Plane)		**GWL[1] (ft) :** None		**GWL Date:**	10/27/05
North (m)	**East (m)**	**Drill Date**	**Ground Level Elevation (ft)**	**Total Depth (ft)**	**Type**
136408.564	575854.362	08/82	642.19	25	Cable

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Welded Steel	2.5	6 5/8	6 1/8	1/4	2.5	25

Borehole Notes:

Casing diameter and casing stickup measurements were acquired by the logging engineer using a caliper and steel tape. Measurements were rounded to the nearest 1/16 in. An approximately 3 by 3-ft concrete pad surrounds the borehole.

Logging Equipment Information:

Logging System:	Gamma 1E		**Type:**	SGLS (70%) SN: 34TP40587A
Effective Calibration Date:	03/04/05	**Calibration Reference:**	DOE/EM-GJ864-2005	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	**1**	**2 Repeat**			
Date	9/29/05	9/29/05			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	26.0	10.0			
Finish Depth (ft)	3.0	5.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N	N			
MSA Interval (ft)	1.0	1.0			
ft/min	N/A[2]	N/A			
Pre-Verification	AE119CAB	AE119CAB			
Start File	AE119000	AE119024			
Finish File	AE119023	AE119029			
Post-Verification	AE120CAA	AE120CAA			
Depth Return Error	N/A	0.0			

Log Run	1	2 Repeat			
(in.)					
Comments	No fine gain adjustment.	No fine gain adjustment.			

Logging Operation Notes:

Logging was conducted with a centralizer on the sonde. Logging data acquisition is referenced to the top of casing. A repeat section was collected in this borehole to evaluate system performance.

Analysis Notes:

Analyst:	Pope	Date:	12/12/05	Reference:	GJO-HGLP 1.6.3, Rev. 0

Pre-run and post-run verifications for the logging system were performed before and after the day's data acquisition. The acceptance criteria were met.

A casing correction for 0.25-in.-thick casing was applied to the log data.

SGLS spectra were processed in batch mode using APTEC SUPERVISOR to identify individual energy peaks and determine count rates. Concentrations were calculated with an EXCEL worksheet template identified as G1EMar05.xls using efficiency functions and corrections for casing, water, and dead time as determined from annual calibrations. No corrections for dead time or water were necessary.

In 1994, RLS data were acquired using ground surface as the zero-depth reference. The RLS depths were adjusted upward by 2.5 feet to match the top-of-casing zero-depth reference of the 2005 SGLS log. The RLS data were decayed to 2005 for comparison with the recent SGLS data.

Results and Interpretations:

^{137}Cs was the man-made radionuclide detected in this borehole. ^{137}Cs was detected intermittently from 3 to 19 ft (below top of casing), with many measurements just above the MDL. Based on reviews of the spectra, ^{137}Cs measurements near the MDL appear to be legitimate. The maximum concentration measured was approximately 0.7 pCi/g at 5.0 ft.

The repeat section indicates good agreement of the naturally occurring KUT and ^{137}Cs concentrations.

The 1994 analysis report indicates that "Detector performance below 23 ft on [the] main log [is] below par," which appears to be manifested in a significant tailing off of count rates, particularly noticeable in the ^{40}K peak. The 1994 RLS repeat log, which includes the questionable data, appears to have provided better data (i.e., KUTh concentrations more consistent with those from footage higher in the borehole). For the RLS/SGLS comparison plot, the RLS repeat data were substituted for the main log data. The comparison of SGLS and RLS ^{137}Cs concentrations shows good agreement after correcting for decay, indicating no significant changes have occurred since 1994. ^{137}C detected in 1994 from 26 to 26.5 ft (below top of casing) is now at concentrations near or below the MDL[3] (approx. 0.18 pCi/g), and was not detected by the SGLS.

List of Plots:

Man-Made Radionuclides
Natural Gamma Logs
Combination Plot
Total Gamma and Dead Time
RLS(1994)/SGLS Man-Made Comparison Plot
Repeat Section of Man-Made Radionuclides
Repeat Section of Natural Gamma Logs

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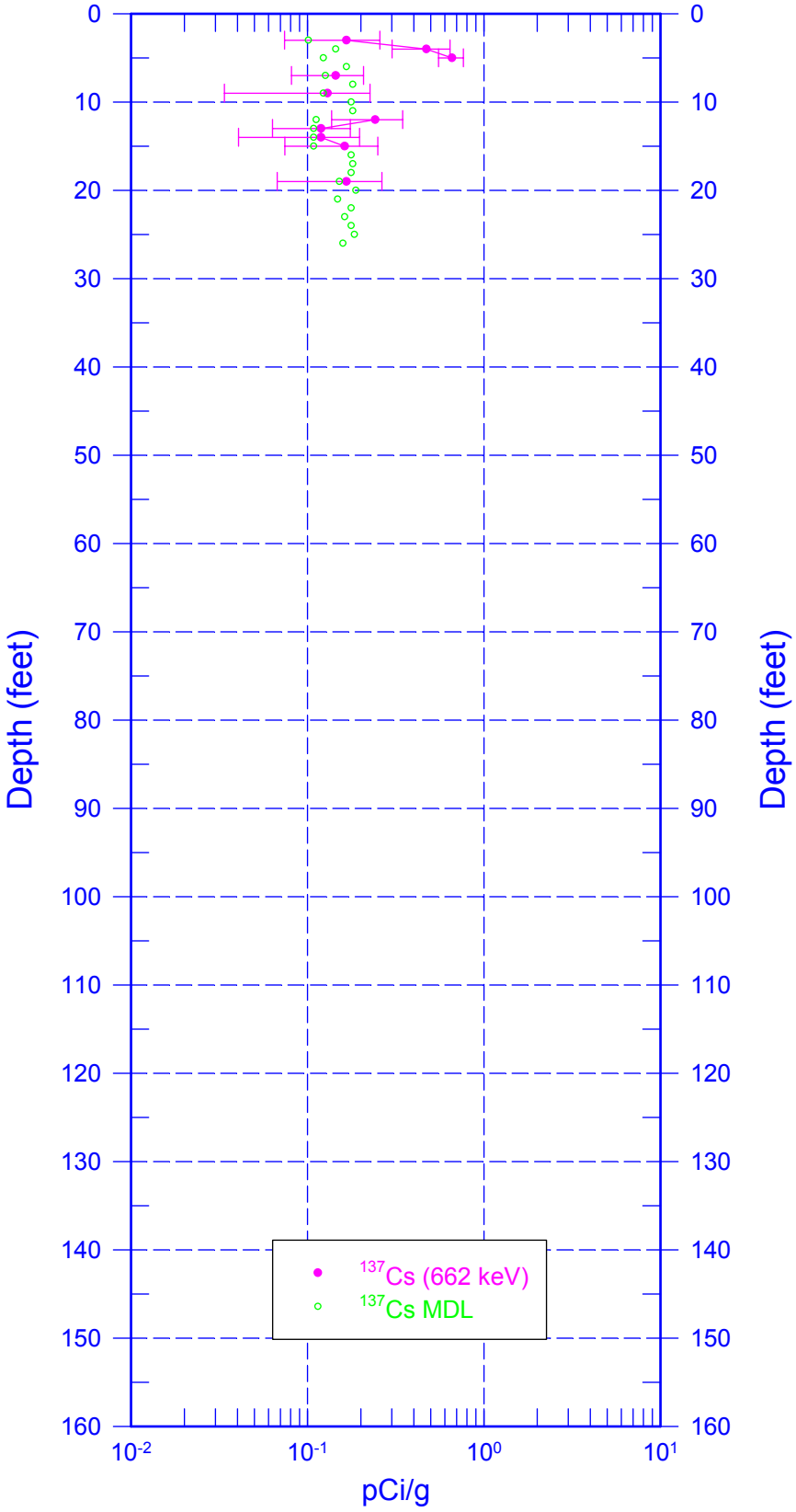
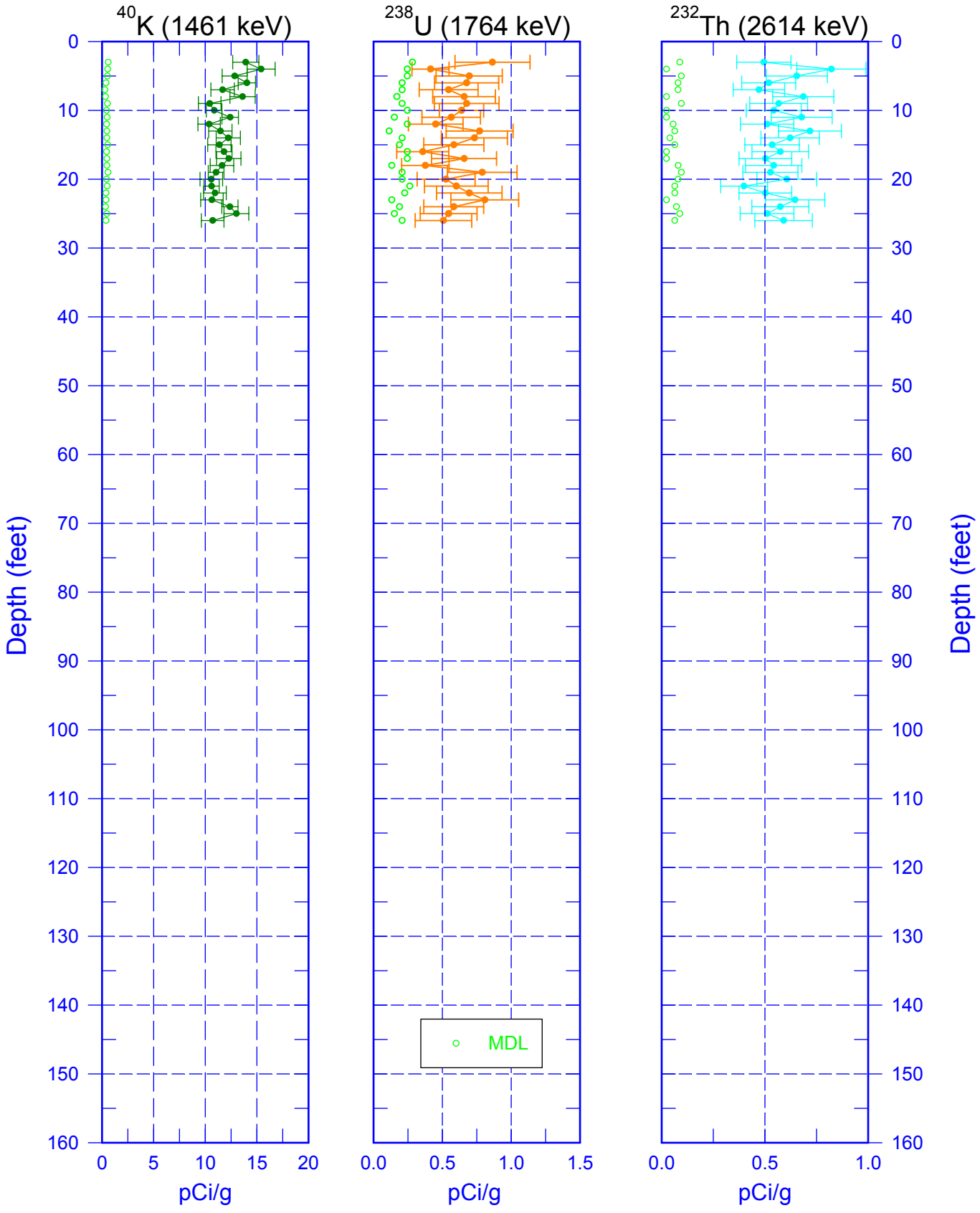
[1] GWL – groundwater level
[2] N/A – not applicable
[3] MDL – minimum detection level

299-E26-72 (A6665)
Man-Made Radionuclides



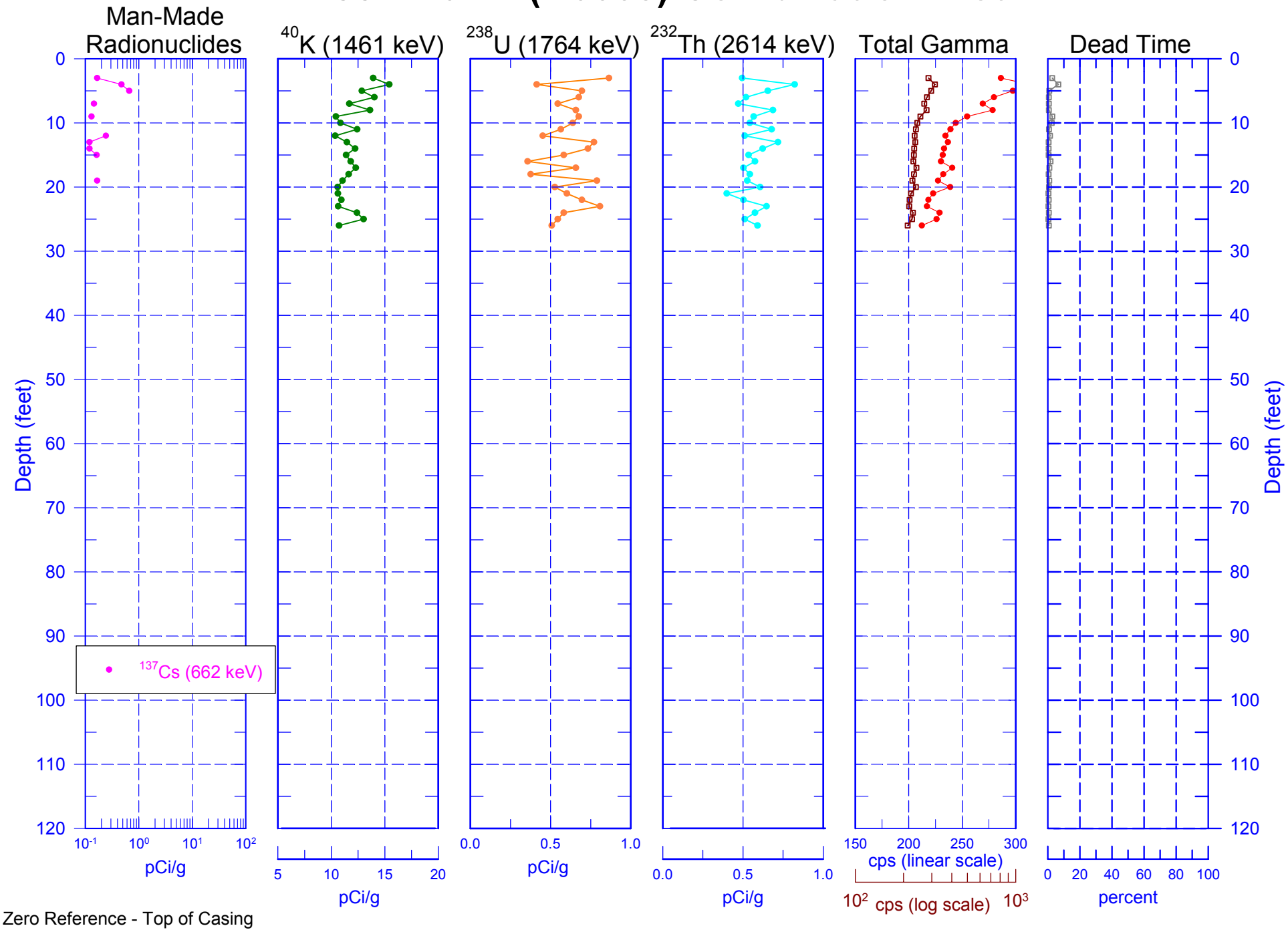
Zero Reference - Top of Casing

299-E26-72 (A6665)
Natural Gamma Logs



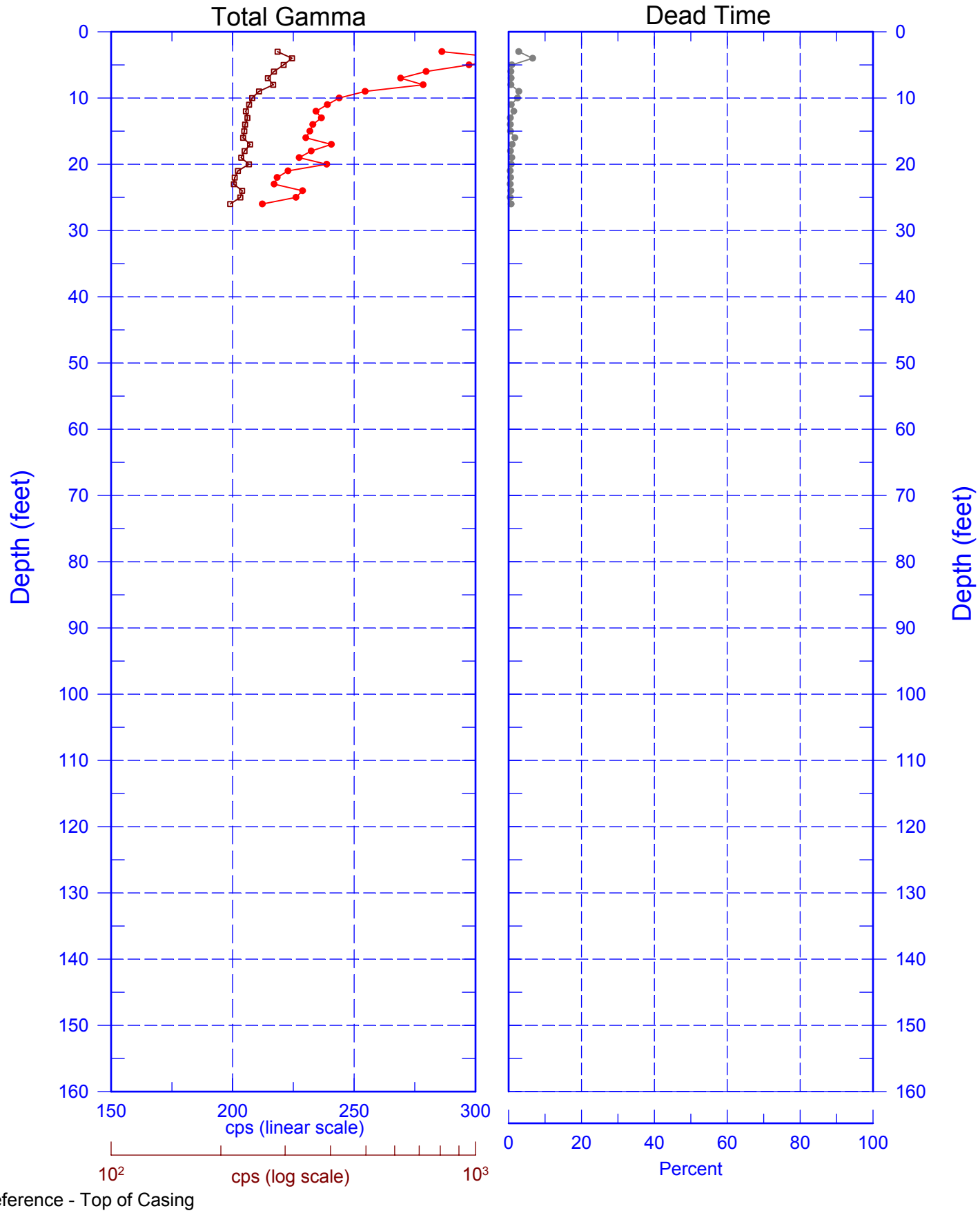
Zero Reference = Top of Casing

299-E26-72 (A6665) Combination Plot



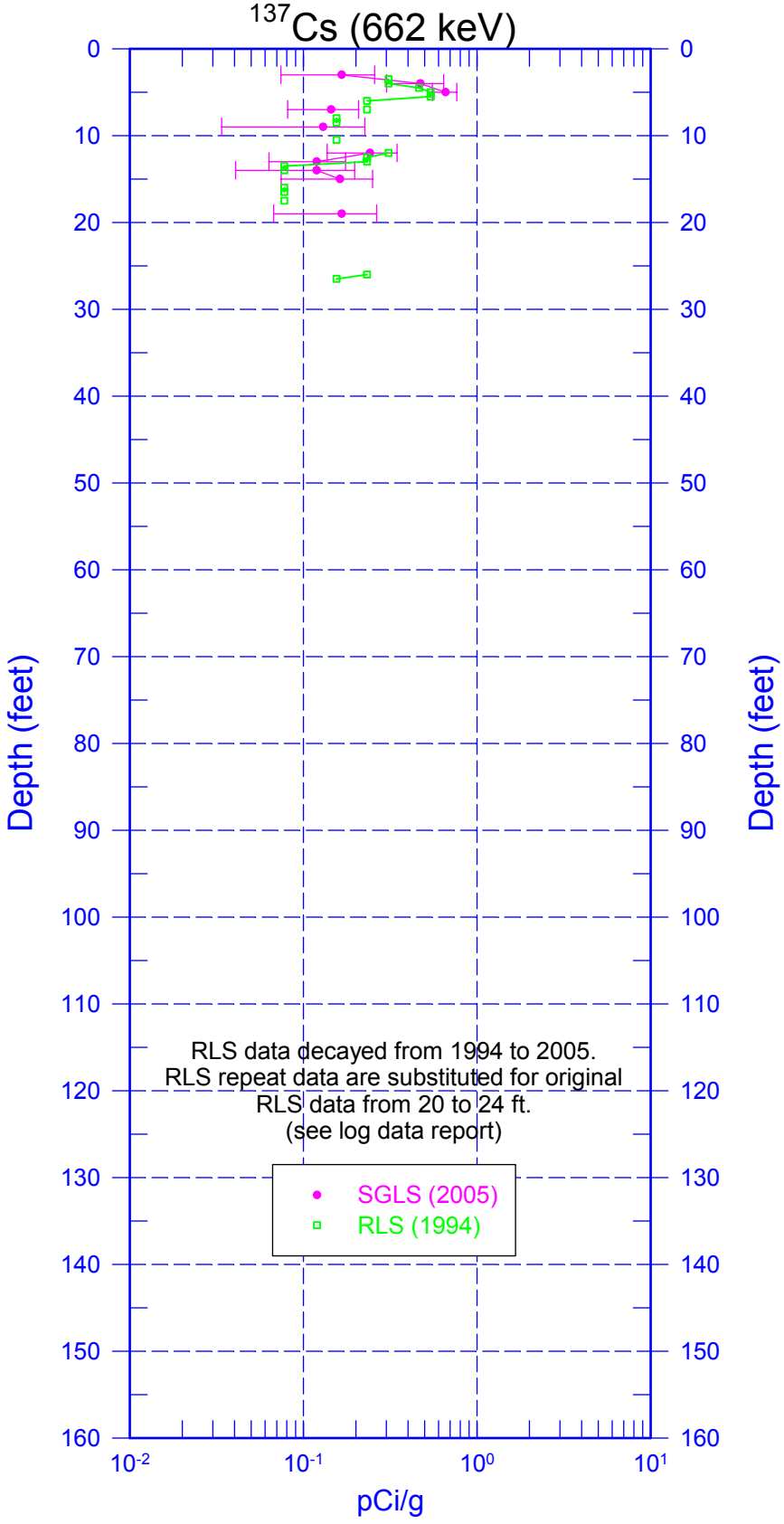
Zero Reference - Top of Casing

299-E26-72 (A6665)
Total Gamma & Dead Time



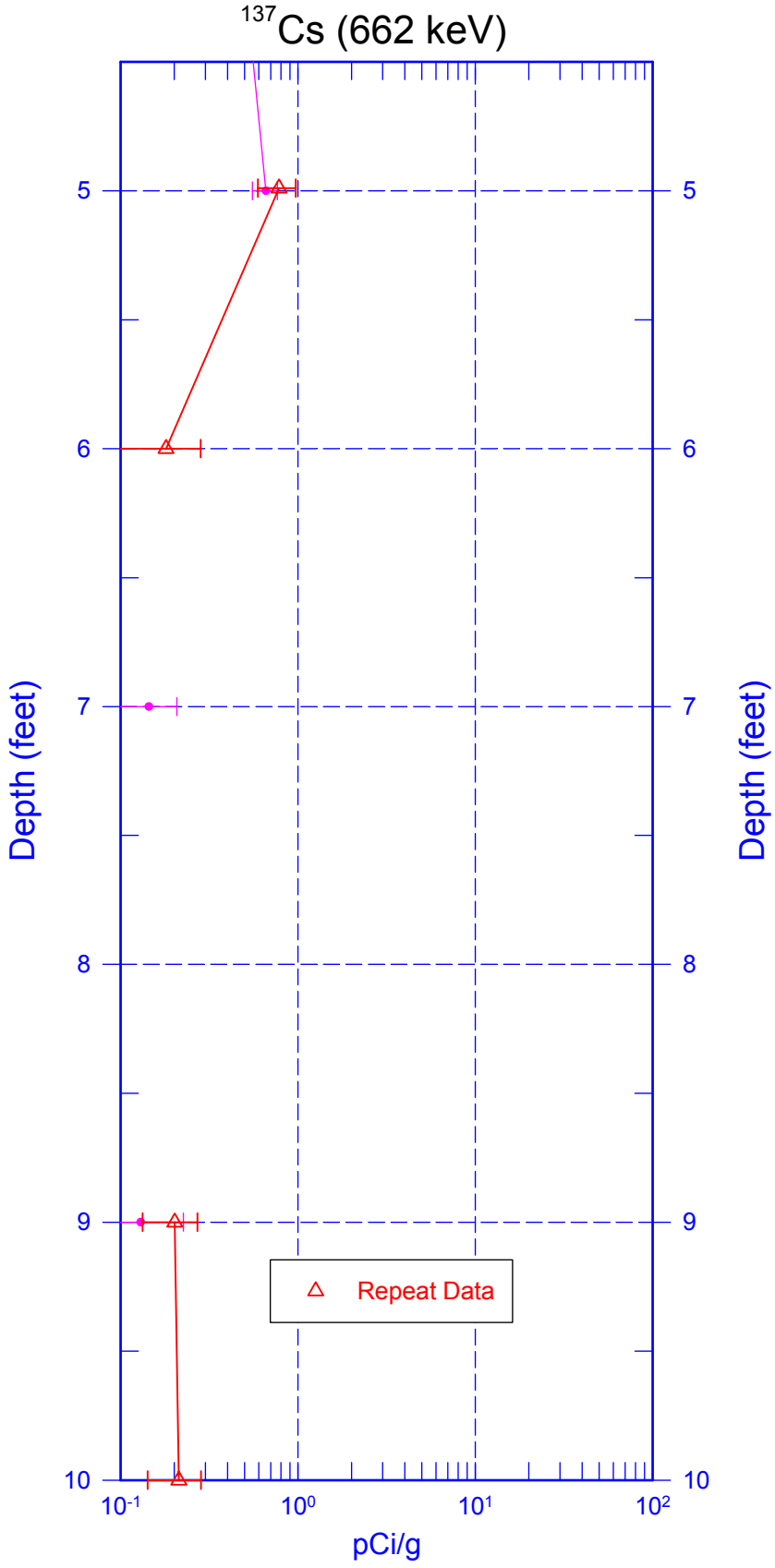
Reference - Top of Casing

299-E26-72 (A6665)
SGLS & RLS Comparison



Zero Reference - Top of Casing

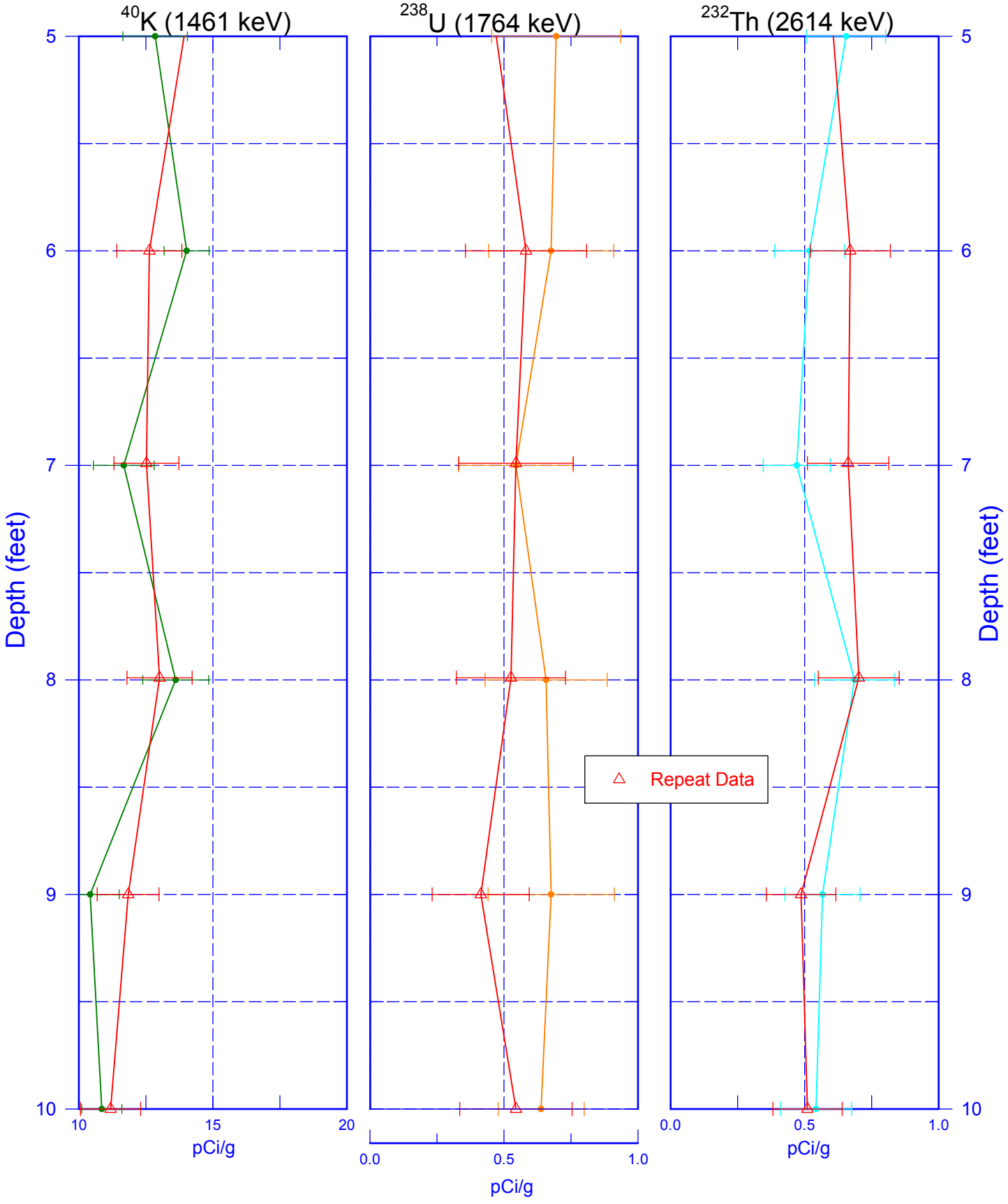
299-E26-72 (A6665)
Repeat of Man-Made Radionuclides



Zero Reference - Top of Casing

299-E26-72 (A6665)

Repeat Section of Natural Gamma Logs



Zero Reference - Top of Casing